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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,598	06/23/2003	Mitsuru Sekiguchi	740819-1014	5485

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EXAMINER

TRINH, MINH N

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/600,598	Applicant(s) SEKIGUCHI, MITSURU	
	Examiner Minh Trinh	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/931,190.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The request filed on 11/14/2004 for a Request Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 10/600,598 is acceptable and a RCE has been established.

An action on the merits of new claims 9-18 as follows.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 14 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear as to what being claimed as (111) orientation with respect to the bottom recess (see claim 14, lines 2-3).

It is not know how a third conductive film is formed by "heating of the first and the second film would form a third conductive film" (see claim 17). Please be more specific.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 9, 11 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Ting et al (5,969,422). Ting et al. discloses the method of the present application including the steps of forming a recess 13 in an carbon-containing insulating film 11 on a substrate (see related Fig. 1, depicts the above method features), depositing a first conductive film 14, comprising a copper alloy film containing Ru (see the discussion at col. 6 Lines 56 to 65), so as to be in contact with a bottom and side surface of said recess forming a second conductive film 15, comprising a copper alloy, by electroplating to completely fill the recess 13 (see the discussion at col. 9 Lines 11 to 16), forming a wire structure 23 by integrating said first and second conductive films (see Fig. 2 shows the wiring).

As applied to claims 11, noting that at col. 9, lines 20-21, and 31-33 of Ting et al describes the step including exposing the surface of 14 to the air by plating 14 on the surface of substrate 11.

As applied to claim 15, Ting et al disclose the second conductive film is copper alloy (see col. 9, lines 17-19).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claim 10, 13 and 15-18 are rejected under 35 U.S.C. 103(a) as being obvious over Ting et al.

As applied to claims 10, 12, 15 and 16, regarding the use of materials including the limitation recites oxide layer free of Cu and the conductive film is 1% of Al or the like are old and known in the art. Therefore, it would have been an obvious matter of design choice to choose any desired materials including that as recited in the above claims since applicant has not disclosed that the use of the oxide metal includes no Cu and that as recited in claims 12 and 16 are critical feature and would solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the teaching of materials such as Cu alloy or Ta alloy, etc., as taught by the Ting reference.

As applied to claim 13, Ting et al do not expressly disclose the forming film by plating and the forming oxide metal including transferring the substrate from the sputtering process to the plating apparatus. It would have been an obvious matter of design choice to choose any desired oxide metal by transferring the substrate from the sputtering process to the plating apparatus since applicant has not disclosed that the claimed limitation as described above would solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the conventional depositing by mean of electroplating and sputtering as taught by Ting et al (see the discussion at col. 11, lines 1-31, etc).

Limitations of claims 15-16 are also satisfied as discussed above (see claim 10).

As applied to claims 17-18, It would have been an obvious matter of design choice to choose any desired wire structure including by heading and removing of conductive film in the recess as to form the wire structure as recited in claim 17 and the step of exposing the insulating film to nitrogen after forming the recess and before depositing the first conductive film as recited in claim 18, since applicant has not disclosed that these features are critical, patentably distinguishing features and it appears that the invention would perform equally well with the step of forming wire structure and the exposing of conductive layers as shown by the prior art reference (see Figs. 1-2 of the Ting et al reference).

Limitation of claim 18 is also met by Ting et al (see above discussion). Furthermore, it would have been an obvious matter of design choice to expose any portion of the conductive layers (the first and second) to air or Nitrogen, etc., since applicant has not disclosed that the features as claimed in claim 18 is critical feature and would solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the teaching where the conductive layers are exposed by air as shown by each of the applied prior art references (see Figs. 1-4 of Ting et al where 14 being placed on the substrate and being exposed to air).

8. Claim 14, as under stood is rejected under 35 U.S.C. 103(a) as being obvious over Ting et al in view of Hsu (6,077,782). Ting et al do not teach the copper film having (111) orientation configurations. However, Hsu discloses the above including copper film having (111) orientation. Therefore, it would have been obvious to one

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ordinary having skill in the art at the time the invention was made to employ the teaching of Hsu into the invention of Ting et al in order to form a desired film structure including improve the characteristic of the film texture.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art references cited for their teaching of semiconductor device manufacturing process or the like.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Trinh whose telephone number is (571) 272-4569. The examiner can normally be reached on Monday -Thursday 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mt



Minh Trinh, 2/14/05

Primary Examiner Group 3700